

# A NEW SPECIES OF *CTENOTUS* (REPTILIA: SCINCIDAE) FROM CENTRAL AUSTRALIA, AND A KEY TO THE *CTENOTUS LEONHARDII* SPECIES GROUP

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## ABSTRACT

A new species of *Ctenotus* Storr (Reptilia:Scincidae), *C. septenarius* sp. nov., from the arid south of the Northern Territory of Australia is described. This species is a member of the *Ctenotus leonhardii* species group (*sensu* Storr *et al.* 1981), and is distinguished from other members of that complex by both scalation and back pattern.

KEYWORDS: Reptilia, Scincidae, *Ctenotus*, new species, Northern Territory, Australia.

## INTRODUCTION

The genus *Ctenotus* Storr, 1964 is the largest and most rapidly expanding taxon of scincid lizards found in Australia. It includes 72 species which are distributed throughout the continent and only one of these occurs in New Guinea. *Ctenotus* species are found in a diversity of habitats ranging from sandy deserts to tropical savannah forest. Moreover, numerous examples of microhabitat specialization are known, where sympatrically distributed species exist in subtly differentiated niches (Pianka 1969).

Storr, Smith and Johnstone (1981) recognised 10 separate species groups in *Ctenotus* and these are the *C. labillardieri* group, *C. essingtonii* group, *C. pantherinus* group, *C. grandis* group, *C. rubicundus* group, *C. lesueurii* group, *C. atlas* group, *C. schomburgkii* group, *C. colletti* group and *C. leonhardii* group. Of these, the *C. leonhardii* group was originally composed of 11 species, most of which are found in arid Australia, with a bias in their distribution towards the west of Australia. That is, 9 of these species occur in Western Australia. Since 1981, this species group has been expanded and now includes the following species: *C. alleni* Storr, 1974; *C. gagudju* Sadlier, Wombey and Braithwaite, 1985; *C. greeri* Storr, 1979; *C. hebetior* Storr, 1978; *C. hilli* Storr, 1970; *C. kurnbudj* Sadlier, Wombey and Braithwaite, 1985; *C. leonhardii* (Sternfeld, 1919); *C. militaris* Storr, 1975; *C. mimetes* Storr,

1969; *C. pulchellus* Storr, 1978; *C. regius* Storr, 1971; *C. rutilans* Storr, 1980; *C. seventyi* Storr, 1975; *C. tanamiensis* Storr, 1970; *C. uber* Storr, 1969. A table summarizing the diagnostic characteristics of the *C. leonhardii* species group is presented as Table 1.

These small to moderately large *Ctenotus* are distinguished from the other species groups by a predominance of reddish rather than olive pigmentation and the replacement of black by dark brown. The pattern is complex and includes longitudinal rows of spots as well as stripes. The dark vertebral and white midlateral stripes may be either distinct, weakly developed or absent. The dark upper lateral zone encloses 1-3 series of pale dots rather than larger spots. In terms of scalation and morphology, the second supraocular scale is not much wider than the first; the lamellae under the toes have an obtuse keel, or narrow to moderately wide callus, and the toes are compressed (from Storr *et al.* 1981).

This paper describes a sixteenth species from the *C. leonhardii* species group which was recently found in the arid southern sector of the Northern Territory. In addition, a key is provided to distinguish the members of the *C. leonhardii* species group.

## MATERIALS AND METHODS

A total of 12 specimens of a previously undescribed species of *Ctenotus* were examined and compared to specimens of the *C. leonhardii* species group. The specimens

**Table 1.** A tabular summary of morphological characteristics which distinguish members of the *Ctenotus leonhardii* species group. Single boxed characters are used to demarcate species, whereas elongate boxes include a cluster of species characterised by a particular feature. Such subdivisions are necessary before diagnostic characters can be used to distinguish members of a cluster. + and - refer to presence or absence of a character.

Character	<i>C. tana-mien-sis</i>	<i>C. gagu-dju</i>	<i>C. kurn-budj</i>	<i>C. uber</i>	<i>C. pulch-ellus</i>	<i>C. mim-etes</i>	<i>C. allen-i</i>	<i>C. hill-i</i>	<i>C. regius</i>	<i>C. greeri</i>	<i>C. rutil-ans</i>	<i>C. leon-hardii</i>	<i>C. septen-arius</i>	<i>C. serv-entyi</i>	<i>C. hebe-tior</i>	<i>C. milit-aris</i>
No dark stripes on body, pattern mostly longitudinal series of whitish dots and dashes	⊕	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Frontoparietals fused to form a single shield	-	⊕	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Series of dark upper lateral blotches on tail	-	-	⊕	-	-	-	-	-	-	-	-	-	-	-	-	-
Pale mid-lateral stripe well developed, at least posteriorly	-	+	+	-			+									
Nasals usually separated	-	-	+	⊕	⊖	+	+	-	+	-	+/-	-	⊕	⊖	+	-
Dark latero-dorsal stripe much wider than vertebral stripe	-	-	+	⊕	⊖	-	+/-	-	+/-	-	+	+/-	-	-	⊕	⊖
Legs spotted with dark brown, rather than streaked	-	-	-	-	-	⊕	-	-	-	-	-	-	-	-	-	-
Pale upper lateral dots tending to clump into large squarish spots	-	-	-	-	-	⊕	-	-	-	-	-	-	-	-	-	-
5 or more dark stripes on back	-	-	-	-	+	-	-					+				
Dark vertebral stripe (if present) not pale edged	-	+	+	+/-	-	+	⊕	⊕	-	-	-	-	-	-	-	-
Less than 30 midbody scale rows	+/-	+/-	+/-	+/-	-	+/-	⊕	⊖	+	+	-	+/-	+/-	+	-	-
Pale mid-lateral stripe extending forward to lores	-	-	-	-	-	+	-	-	⊕	-	-	-	⊕	⊕	-	-
26 or less midbody scale rows	-	-	+/-	-	-	+/-	+/-	-	+/-	⊕	-	-	-	-	+/-	-
34 or more midbody scale rows	-	-	-	+/-	+/-	-	-	+/-	-	-⊕	⊖	-	-	-	-	+/-
26 or more subdigital lamellae under 4th toe	+/-	+/-	+/-	+/-	+/-	+/-	+	+/-	+/-	+/-	+	+/-	⊕	⊖	+/-	-

failed to key out to any of the currently recognised *Ctenotus* species and are here described as a new species. The scalation nomenclature used follows that defined by Storr *et al.* (1981:193-8). A series of 25 counts and measurements were made on each specimen using micrometer adjusted calipers and a steel rule.

**SYSTEMATICS**  
*Ctenotus septenarius* sp. nov.

(Figs 1-3)

**Type material.** HOLOTYPE — gravid ♀, NTM R13704, Bacon Range, near Henbury meteorite craters, 24° 35S 133° 08E, Northern Territory, coll. G. Fyfe, 17.ix.1986, beneath small rock slab. PARATYPES — NORTHERN TERRITORY: 1 ♀, NTM R13705, same data as holotype; 1 ♂, NTM R13706, same data except 24° 34S 133° 08E, 11.ix.1986; 2 ♂, NTM R13707-8, same data except 17.ix.1986; 3 ♂, 1 ♀, NTM R13709-12, same data except 18.ix.1986; 1 ♀, NTM R13713, 25° 18'S 130° 44'E, Valley of Winds on N.W. side of Mount Olga, coll. G. Fyfe and T. Barnett, 20.viii.1986; 1 ♂, juv., NTM

R15089-90, 25° 17'S 130° 43'E, on S.E. side of Mount Olga, coll. J.A. Kerle, 5.iii.1988.

**Diagnosis.** Distinguished from all other members of the *Ctenotus leonhardii* species group by the possession of seven dark dorsal stripes. It may be further distinguished from most similar members of the *C. leonhardii* species group, that is those with five dark stripes in their back pattern, by the following characters. In *C. septenarius* the midlateral stripe is prominent and extends to the face as either a solid line, or as dots and dashes, when anterior to the forelimbs. In contrast, a midlateral line is either completely absent, or only present on the posterior portion of the body, in *C. pulchellus*, *C. hebetior* and *C. militaris*. *C. serventyi* has a similar lateral pattern to *C. septenarius*, but is distinguished from this species by the lower number of subdigital lamellae beneath the fourth toe (18-24 compared to 26-32), and usually contacting nasal scales.

*C. septenarius* is also distinguished from other *Ctenotus* species groups which have a multilined back pattern, by the characteristic red-brown dorsal background colouration.



Fig. 1. *Ctenotus septenarius* holotype, when alive.

Fig. 2. *Ctenotus septenarius* juvenile, from Mt. Olga. Scale line 10mm.

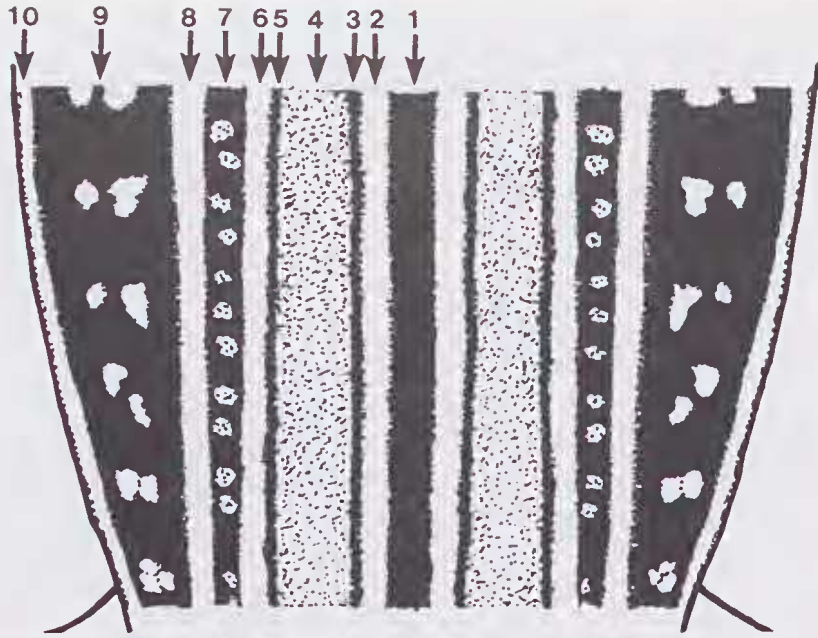


Fig. 3. Diagrammatic representation of the lower dorsal back pattern of *Ctenotus septenarius*. The numbers correspond to each of the dorsal stripes and are as follows — 1, Vertebral (dark violet-brown); 2, Paravertebral (cream); 3, Dorsal 'a' (dark violet-brown); 4, Red-brown background; 5, Dorsal 'b' (dark violet-brown); 6, Latero-dorsal (cream); 7, Latero-dorsal (dark violet-brown); 8, Dorso-lateral (white); 9, Upper lateral zone (dark violet-brown); 10, Mid-lateral (white).

**Description.** The holotype has the following characteristics:

**Head:** Width 6.9mm, depth 6.7mm, 12.3mm long from tip of rostral scale to anterior margin of ear (19% of SVL). Snout 5mm long from tip of rostral scale to anterior margin of orbit. Snout pointed. Nasal scales separated by rostral and frontonasal scales, internasal scales absent, prefrontal scales separated by frontal scale. Two loreal scales (L and R), posterior loreal scales 1.4 times as wide as high, twice size of anterior loreal scales. Frontoparietal scales paired. Interparietal scale distinct. Parietal scales large and in contact behind interparietal. Five nuchal scales (L), six (R). Single primary temporal scale and two secondary temporals (L and R). Four supraocular scales (L and R) first three contacting frontal, second subequal to first and third. Nine supraciliary scales present (L and R). First largest, 4th to 6th markedly smaller than others. Eleven upper palpebral scales (L), twelve (R). Lower eyelid moveable, opaque. Two pre-subocular scales (L and R). Eight supralabial scales (L and R), sixth under orbit. Seven infralabial scales (L and R), two contacting postmental. Four obtusely pointed ear

lobules on anterior margin of oval auricular opening, lowest smallest. Tympanum sunken. Opening 2.4mm high, 1.1mm wide.

**Body:** Elongate, slender and as wide as deep. Snout vent length 65.0mm. Axilla to groin length 38mm (58% of SVL). Tail length 127mm (posterior 20% not original). Tail slender, round in section and tapers to point. Dorsal scales smooth with four parallel rows of larger paravertebral scales extending from nuchals to tail. 75 paravertebral scales to vent where they form two rows of larger scales. Scales on sides small and smooth, those on abdomen twice as large as lateral scales. Subcaudal scales single and very large. Twenty eight body scale rows around the midline. The specimen was gravid and contained two eggs 19mm (L), 18mm (R) in length.

**Limbs:** Pentadactylic with extremely long, pointed and compressed toes. Length of forelimb 19mm (29% of SVL), length of hindlimb 34mm (52% of SVL). Length of fourth toe 11.2mm (33% of hindlimb length). 31 subdigital lamellae under fourth toe, excluding claw. These are undivided and each with narrow light brown callus.

**Table 2.** Morphometric and meristic characteristics of *Ctenotus septenarius*.

Characters	N = 10	
	$\bar{x}$	R
Snout-Vent length in mm	60.4	(55-65)
Axilla-Groin length in mm	30.9	(26-38)
Forelimb length in mm	18.2	(16-19)
Hindlimb length in mm	32.7	(30-34)
Fourth toe length in mm	11.7	(11-12)
Head width in mm	7.7	(6.9-9.3)
Head depth in mm	6.5	(5.8-7.5)
Nostril-Snout Length in mm	1.1	(1.0-1.3)
Orbit-Snout length in mm	5.3	(4.8-5.5)
Ear-Snout length in mm	12.7	(11.9-13.7)
Forelimb-Snout length in mm	21.8	(19.0-23.5)
Nasals in contact (+ or -)	11; 1+	
Prefrontals in contact (+ or -)	5; 6+	
Number of supraciliaries	9.1	(8-11)
Number of upper palpebrals	10.7	(10-12)
Number of presuboculars	2.0	(2)
Number of loreals	2.0	(2)
Number of supralabials	8.0	(8)
Number of infralabials	6.9	(6-8)
Number of nuchals	4.3	(3-6)
Number of temporals	3.0	(3)
Number of ear lobules	3.6	(3-5)
Number of subdigital lamellae	28.9	(26-32)
Number of midbody scale rows	28.6	(28-30)
Number of paravertebral scale rows	70.1	(64-75)
Axilla-Groin length to Snout-Vent length ratio	1:1.9	(1:1.7-1:2.1)
Forelimb length to Snout-Vent length ratio	1:3.3	(1:3.0-1:3.7)
Hindlimb length to Snout-Vent length ratio	1:1.8	(1:1.7-1:2.1)

**Colouration.** (in alcohol) *Head:* Dorsal surface mid-brown. Darker mottling on frontal, frontoparietal, interparietal and parietal scales. Dark violet-brown latero-dorsal and cream dorso-lateral stripes begin at first supraocular scale and first supraciliary scales respectively, then extend along dorsal surface of body. Temporal region also dark violet-brown with three cream spots between ear and orbit. White stripe extends from second loreal scale (posterior margin), beneath orbit to auricular opening. It then extends along side of specimen as prominent white midlateral stripe. Supralabials pale brown mottled with grey. Infralabials mottled grey and off-white. Ventral surface off-white changing to cream on chin.

*Body:* Dorsal surface red-brown with complex pattern of stripes. In neck to shoulder region pattern consists of 5 dark violet-brown stripes, four light stripes and two broad zones

of red-brown background colour. Posterior to this, dorsal pattern expands into seven dark stripes, 6 light stripes and two broad zones of background colour (Fig. 3). In detail; dark violet-brown vertebral stripe (1 of Fig. 3) half as wide as paravertebral scales, extends from posterior margin of parietal scales to base of tail. Vertebral stripe margined by cream paravertebral stripes (2 of Fig. 3) which are half as wide as vertebral stripe. Paravertebral stripe bordered by narrow (quarter width of vertebral), dark violet-brown stripe (3 of Fig. 3) which extends from shoulders to hindlimbs. This separates cream paravertebral stripe from wide zone of red-brown background colour (4 of Fig. 3). A second narrow dark violet-brown stripe (5 of Fig. 3), also extending from shoulders to hindlimbs, separates red-brown zone from equally narrow cream latero-dorsal stripe (6 of Fig. 3). Dorsal stripes (3 and 5 of Fig. 3) coalesce in the region of the forelimbs to produce single stripes on neck. The cream latero-dorsal stripe (6 of Fig. 3) extends along length of back and borders dark violet-brown latero-dorsal stripe (7 of Fig. 3), which is as wide as vertebral stripe, and extends from above orbit to posterior of hindlimbs. In posterior region, latero-dorsal stripe flecked with light brown. Distinct white dorso-lateral stripe (8 of Fig. 3) borders black latero-dorsal stripe and extends from first supraciliary scale to base of tail. From distance back pattern appears as three dark stripes edged in white (Figs 1 and 3).

Upper lateral zone of body dark violet-brown (9 of Fig. 3) three scales wide, and extends from behind orbit to base of tail. Longitudinally biased series of 40 white spots in this zone. Prominent white mid-lateral stripe (10 of Fig. 3) one scale wide, borders upper lateral zone and extends from second loreal scale to groin. In area between forelimb and orbit mid-lateral stripe interrupted by two intrusions of dark-violet brown lateral zone and also auricular opening. Lower lateral zone, two scales wide, mottled dark brown and white spots (approximately 25), this coalesces into immaculate silver grey ventral surface.

*Limbs:* Light brown background colouration on dorsal surface of forelimbs separating three black stripes. Cream on ventral surface. Hindlimbs similar but with four black stripes.

*Tail:* Light brown on dorsal surface. Basal portion has remnants of dark vertebral and light dorsolateral stripes. Dark upper lateral zone of body extends along sides of tail as a dark edged midbrown stripe. Cream on ventral surface.

**Distribution and habitat.** Specimens of *C. septenarius* were collected on the lower slopes of rocky hills associated with the Henbury meteorite craters and Mount Olga. At the former locality, the substrate consisted of gibber like plains with numerous small fist sized rocks and occasional larger slabs. At the latter, shallow soils separated fist to head sized rocks imbedded in the surface.

The Henbury sites were sparsely vegetated with blue bush (*Maireana* sp.), scattered *Cassia* shrubs and *Aristida* grass tussocks. The north western Mount Olga locality was predominantly *Acacia* shrubland (*A. aneura* and *A. pruinocarpa*) with scattered *Aristida* grass clumps and *Cassia* shrubs. In contrast, the south eastern Mount Olga locality centred on a stony creek bed with silt deposits. Here a relatively dense thicket of *Melaleuca* was the dominant vegetation. Observations at all localities suggest that *C. septenarius* is a burrowing species, and burrows either under rocks or vegetation.

The restricted distribution of this species suggests that *C. septenarius* lives in a relatively specialized habitat type. However, one of us (G.F.) has also observed specimens putatively identified as *C. septenarius* near Ayers rock (Uluru), which suggests a wider distribution. It is noteworthy that the ubiquitous *C. leonhardii*, a widely distributed habitat generalist, was sympatric with *C. septenarius* at both Henbury meteorite craters and Mount Olga.

**Variation amongst the paratypes.** The specimens analysed are generally uniform in most characteristics of scalation and morphology. This variation is summarised in Table 2.

Specimens from the type locality do not vary markedly from the holotype in their colouration. The series of specimens from Mount Olga differ slightly in that the pale midlateral stripe is less regular in form on the anterior portion of the body directly behind the forelimbs (Fig. 2).

In most specimens, the seven dark violet-brown dorsal stripes may become indistinct, anteriorly coalescing to form 5 stripes. They

are however quite distinct in the posterior half of the body.

**Etymology.** The species name *septenarius* is derived from the latin term *septenarius* which means 'containing seven'. This refers to the seven characteristic black stripes found in the back pattern of this species.

### A key to species of the *Ctenotus leonhardii* species group

Because of the increase in size of this species group and the great similarity in species morphology, a key separating the species is included and has been derived from the following sources: Cogger (1986); Sadlier *et al.* (1985); Storr (1969, 1974, 1978) and Storr *et al.* (1981).

1. No dark stripes on body, pattern mostly longitudinal series of whitish dots and dashes .. *tanamiensis* Storr  
Pattern more complex, contains dark stripes or zones ..... 2
- 2(1). Frontoparietals fused to form a single shield ..... *gagudju* Sadlier, Wombey and Braithwaite  
Frontoparietals divided ..... 3
- 3(2). Series of dark upper lateral blotches on tail ..... *kurnbudj* Sadlier, Wombey and Braithwaite  
Tail pattern without dark upper lateral blotches ..... 4
- 4(3). Little or no indication of pale mid-lateral stripe ..... 5  
Pale mid-lateral stripe well developed, at least posteriorly ..... 6
- 5(4). Nasals usually separated; dark latero-dorsal stripe much wider than vertebral stripe and enclosing a series of pale spots ..... *uber* Storr  
Nasals usually in contact; dark latero-dorsal stripe about as wide as vertebral stripe and not enclosing pale spots ..... *pulchellus* Storr
- 6(4). Pale upper lateral dots tending to clump into large squarish spots; legs spotted with dark brown .....  
..... *mimetes* Storr  
Pale upper lateral dots not clumping; legs longitudinally streaked ..... 7
- 7(6). Less than 5 dark stripes on back .. 8  
5 or more dark stripes on back .. 13
- 8(7). Dark vertebral stripe (if present) not pale edged ..... 9

- Dark vertebral stripe distinctly pale edged ..... 10
- 9(8). Less than 30 midbody scale rows ...  
..... *alleni* Storr  
30 or more midbody scale rows .....  
..... *hilli* Storr
- 10(8). Pale mid-lateral stripe extending forward to lores ..... *regius* Storr  
Pale mid-lateral stripe seldom extending beyond forelimb and never past ear ..... 11
- 11(10). 26 or less midbody scale rows .....  
..... *greeri* Storr  
More than 26 midbody scale rows ..... 12
- 12(11). 34 or more midbody scale rows .....  
..... *rutilans* Storr  
Less than 34 midbody scale rows ...  
..... *leonhardii* (Sternfeld)
- 13(7). Pale mid-lateral stripe extending forward to lores ..... 14  
Pale mid-lateral stripe not extending beyond forelimb ..... 15
- 14(13). Nasals usually separated; subdigital lamellae under 4th toe 26-32 .....  
..... *septenarius* sp. nov.  
Nasals usually in contact; subdigital lamellae under 4th toe 18-24 .....  
..... *serventyi* Storr
- 15(13). Dark vertebral stripe narrower than dark latero-dorsal stripe; 30 midbody scale rows ..... *hebetior* Storr  
Dark vertebral stripe as wide as or

wider than dark latero-dorsal stripe; 30-40 midbody scale rows .....  
..... *militaris* Storr

#### ACKNOWLEDGEMENTS

With many thanks to Chris Haigh for her prompt and excellent typing.

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Accepted 3 August 1988